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A new species of the lichen genus *Phlyctis* from Maharashtra, India

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Abstract—A new species, *Phlyctis communis*, characterized by 8-spored asci, 7–14(–16) transversely septate ascospores, and salazinic and norstictic acids, is described from India.

Key words—*Ascomycetes*, *Ostropales*, taxonomy

Introduction

Although taxonomic accounts of several lichen genera from Maharashtra have been published and many species have been described (Chitale et al. 2008, 2009, 2011, Chitale & Makhija 2008, Dube et al. 2005, Dube & Makhija 2008, 2010), one locally common and abundant interesting species has remained unpublished. For several years a conspicuously grayish-white unidentified crustose lichen was known to occur all over Maharashtra, mostly during the monsoons in the humid high altitude regions. This has now been identified and is described as a new species of the genus *Phlyctis*.

The subtropical to temperate lichen genus *Phlyctis* (Wallr.) Flot., confirmed by phylogenetic sequence analysis as belonging in the *Ostropales* (Miadlikowska et al. 2006), is characterized by a smooth to verrucose crustose thallus, protococcoid green algal photobiont, sunken or erumpent, round apothecioid ascomata with indistinct thalline margins, proper exciple present or absent, unbranched or apically furcate paraphyses, 1–8-spored asci, and ascospores that are colourless, transversely septate to multicelled-muriform, thin walled, elongate-ellipsoid, and non-halonate.

Phlyctis species generally contain one or several of the following depsidone acids: stictic, constictic, norstictic, connorstictic, hypostictic, salazinic psoromic, neopsoromic and/or protocetraric acids (Galloway & Guzmán 1988).

The genus is widely distributed, with 12 species listed by Kirk et al. (2008) and five others from Great Britain and Ireland (Benfield et al. 2009), China (Ma

et al. 2010), India (Joshi et al. 2010), and Australia (Lumbsch et al. 2011) added since 2008. Of these only five — *Phlyctis himalayensis* (Nyl.) D.D. Awasthi, *P. nepalensis* Räsänen, *P. polyphora* Stirt., *P. karnatakana* S. Joshi & Upreti, and *P. subagelaea* S. Joshi & Upreti — have been reported from the Indian subcontinent (Awasthi 2000, Joshi et al. 2010).

In the present study, one new species has been discovered from Maharashtra that represents the first record of *Phlyctis* from this area.

Materials & methods

The specimens were examined using a stereomicroscope and a light microscope. Sections of the thalli and apothecia were stained with Lugol's iodine solution. All sections examined were mounted in LPCB (lactophenol with cotton blue). TLC protocols followed Culberson & Kristinsson (1970) and White & James (1985). All specimens were observed under UV light (365 nm). The present study is based on the material preserved in the lichen herbarium of Ajarekar Mycological Herbarium (AMH) and recent collections by the authors from Maharashtra state.

Taxonomy

Phlyctis communis Chitale & Makhija, **sp. nov.** Figs 1–4

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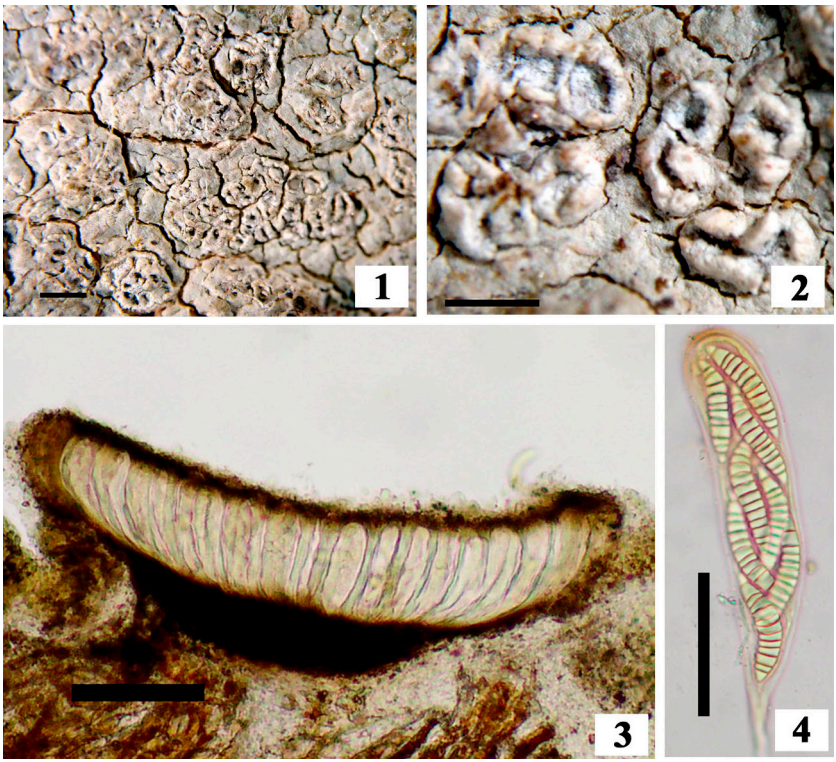
Similis Phlyctidae karnatakanae *sed ascosporis 7–14(–16) trans-septatis et acidum norsticticum et salazinicum continenti differt.*

Type: India, Maharashtra, Satara District, Mahabaleshwar, 24.9.1997, U.V. Makhija, (**Holotype**, AMH 97.52).

Etymology: Latin *communis*, referring to the plentiful or common occurrence.

Thallus crustose, corticolous, grayish or greenish-white, spreading over the bark substratum in 5–12 cm patches, cracked, areolate, matt, sometimes glossy, white in cracks and 90–120 µm thick at the margin; epiphloeodal algal layer 30–35 µm thick, green algae single celled, more or less globose, 5–7 µm diam.; hypothallus black.

Ascomata black, round, oblong, numerous, scattered all over the thallus and radially arranged in small 1–2(–3.5) mm diam. circles, later grouped and merging into each other forming patches on the bark of tree trunks, individual ascomata ≤1 mm across, immersed in the thallus; disc black, plane to concave, covered by a white pruina; exciple brownish, composed of loosely interwoven hyphae in the peripheral region, and blackish-brown at the base; epihymenium dark brown, 30–33 µm thick, KI–; hymenium colourless to light yellow, 72–81 µm tall, KI+ blue; paraphyses simple to branched at tips; hypothecium brownish, 12–15 µm thick; asci 8-spored, 90–105 × 18–24 µm, entire ascus KI+ blue. Ascospores hyaline, 7–14(–16) transversely septate, very rarely with 1–2 vertical septa, 18–33(–45) × 6–9 µm.



Figures 1–4. *Phlyctis communis* (holotype): 1–2, habit; 3, vertical section of the ascocarp; 4, transseptate ascospores. Scale bars: 1–2 = 1 mm; 3–4 = 50 µm.

Chemistry—Thallus K+ yellow turning red, C–, KC–, P+ yellow; UV–; norstictic and salazinic acids present.

Selected additional specimens examined (total specimens = 110, all in AMH)—**India**. **Maharashtra**: Kolhapur District, Ajra, 6.10.2004, B.C. Behera, N. Verma, AMH 04.320, U.V. Makhija & G.S. Chitale, AMH 04.389, Amba, 16.10.1974, C.R. Kulkarni & A.V. Prabhu, AMH 74.1282, on the way to Kumbhi from Gaganbawada, 12.10.2000, B.A. Adawadkar & K.R. Randive, AMH 00.337. Pune District, Amby valley, 10.2.2006, G.S. Chitale, AMH 06.181; Boma Hills, Khandala, 19.9.1974, M.B. Nagarkar & C.R. Kulkarni, AMH 74.691, Walwan Dam, 16.9.2002, A.V. Bhosale & G.S. Chitale, AMH 02.113. Satara District, Mahabaleshwar, 1.11.1973, C.R. Kulkarni, AMH 73.2938; Panchgani, Tata Holiday Home, 29.9.2003, U.V. Makhija & B.C. Behera, AMH 03.369. Sindhudurg District, Ajra to Amboli, 7.12.1974, P.G. Patwardhan & A.V. Prabhu, AMH 74.2248, 10.10.2000, U.V. Makhija & V.A. Mantri, AMH 00.176.

Remarks— With respect to external morphology and ascospore size, *Phlyctis communis* resembles *P. karnatakana*, also from India, which differs in fewer ascospore septa (7 transsepta) and containing only norstictic acid.

Phlyctis subuncinata Stirt., also with norstictic acid and transversely septate ascospores, differs in having a sorediate thallus.

Two other *Phlyctis* species with transversely septate ascospores — *P. himalayensis* from India and *P. longifera* (Nyl.) D.J. Galloway & Guzmán from New Zealand — differ especially in having larger, 7-septate ascospores. *Phlyctis himalayensis* ascospores measure 60–75 × 6–8 µm, whereas *P. longifera* ascospores are 55–86 × 5–7 µm.

Phlyctis psoromica Elix & Kantvilas, also with transversely septate ascospores, has only (3–)7-septate ascospores (30–39.3–50(–52) × 4–5.2–6 µm) and contains psoromic acid.

The somewhat similar *P. polyphora* from India shares a whitish thallus and a pruinose ascomatal disc ≤1 mm diam. but is distinguished by very large (60–110 × 7.5–9.5 µm) muriform ascospores.

Phlyctis communis is very common and has been collected from semi-evergreen to dry deciduous forests with relative humidity between 15–90% where thalli grow in huge patches on the bark of *Ficus benghalensis* and *Casuarina equisetifolia* where it frequently associates with *Arthothelium awasthii* Patw. & Makhija.

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